

at 10h. 2m., ending of total phase at 10h. 48m., and last contact with shadow at 11h. 49m.

A PROBABLE VARIABLE STAR.—On November 25 Swift's comet was compared with the star No. 4339 of Lalande, by Mr. Talmage at Mr. Barclay's Observatory, Leyton, the magnitude of the star being estimated 8, as it was also by Lalande. Argelander, in the *Durchmusterung*, gives it 6.4, and Heis made it a naked-eye star (6.7), but erroneously identifies it with Lalande 4359. It escaped observation in the Bonn Zones, and may be worth occasional examination as likely to prove an addition to our variable star list.

FAYE'S COMET.—In the *Berliner astronomisches Jahrbuch* for 1882, Prof. Axel Möller, of Lund, has given an ephemeris of Faye's comet extending to the end of March next. On comparing the theoretical intensity of light appended to the ephemeris with that corresponding to particular epochs in other appearances, it will be found that there is a probability of observing the comet for some weeks from this time without difficulty if the larger instruments be employed. Thus at the beginning of January the calculated degree of brightness is more than twice that appertaining to the dates when the comet was first and last observed with the Northumberland telescope at Cambridge, during the return of 1850-51, and the geocentric position is favourable for observation; a month later the intensity of light is still equal to that at the time of the first observation with the Copenhagen refractor in 1865, and even at the close of Prof. Axel-Möller's ephemeris it is equal to that at the first and last Cambridge observations above alluded to; the comet's place, however, will then be drawing into the evening twilight. We have already remarked that the magnitude of the planetary perturbations of the comet's motion during the revolution 1873-1881 is greater than in any other revolution since the comet's discovery in 1843, and the success which has again attended his prediction of its apparent track in the heavens must have excited the admiration of those who have any experience or knowledge of such investigations, and the immense amount of skilled application involved in them.

SWIFT'S COMET.—The following elements depend upon Mr. Chandler's observation on October 25, one at Strassburg on November 9, and a third at Mr. J. G. Barclay's Observatory, Leyton, on November 25:—

Perihelion passage 1880, November 8.3691 Greenwich M.T.

Longitude of perihelion	0° 15' 2"
" ascending node	294 46' 6"
Inclination	7 21' 3"
Log. perihelion distance	0.04188
Motion—direct.		

The close resemblance to the orbit of the third comet of 1869, it will be seen, is maintained. The elements give these positions for Greenwich midnight:—

	R.A.	Decl.	Log. distance from	$\frac{1}{r^2 \Delta^2}$
	h. m.	° ' "	Earth. Sun.	
Dec. 2	3 44.1	+50 57	9.3188	0.0680
3	3 53.6	50 10		
4	4 2.5	49 21	9.3366	0.0721
5	4 10.7	48 32		
6	4 18.5	47 41	9.3556	0.0765
7	4 25.6	46 50		
8	4 32.3	+45 59	9.3756	0.0811

UNIVERSITY AND EDUCATIONAL INTELLIGENCE

OXFORD.—No further regulations have been issued by the University Commissioners for the Professoriate. Opinion is much divided in the University itself as to the operation of the new rules. There have been several memorials to the Commissioners got up, some praying that no alterations be made, others approving the new Councils of the Faculties. There seems to be a general feeling against insisting on the professors examining their classes every term, and against making attendance at their lectures compulsory. The Councils of Faculties are regarded by many with favour as a means of bringing the tutors and lecturers of the various colleges who are engaged in teaching the same branch of learning into closer relationship, and enabling them better to divide the work among them.

At Balliol College an extra scholarship on the Brakenbury Foundation has been awarded to Mr. A. D. Hall of Manchester Grammar School, for Natural Science.

A MEETING of the Convocation of Victoria University was held at Owens College, Manchester, on Friday, Dr. Greenwood presiding. A resolution was received from the Associates of the College expressing their gratification at the creation of the University, and pledging themselves to perform their part in maintaining the welfare, dignity, and fame of the University, and promoting its objects. Standing orders for the regulation of the proceedings of Convocation were adopted, and the Rev. C. J. Poynting was appointed clerk.

THE recently-presented budget of Prussia shows that, despite the financial straits of the kingdom, no considerations of economy are allowed to hamper the growth of its scientific and educational system. First on the list come the nine universities with an allotment of 7,050,000 marks (352,500*l.*). Berlin receives the lion's share, 1,378,348 marks, an increase of about 37,000 marks on its last annual subvention. Bonn and Königsberg each have 740,000 marks, Breslau 600,000, Kiel 404,000, Marburg and Halle each 430,000, Göttingen 201,000, and Greifswald 136,000. Of the above-mentioned sum about 1,306,000 marks are appropriated for extraordinary expenses in connection with the construction of university buildings, and of this amount Berlin absorbs over one-half, viz., 766,000 marks. The other chief items in the Budget of Public Instruction are: Gymnasia and Realschulen, 5,000,000 marks; primary schools, 14,500,000; orphanages, schools for the blind, deaf and dumb, &c., 300,000; technical schools, and for the general furtherance of science and art, 3,000,000 marks.

THE number of pupils of Lycées and Colleges in the French Republic is 87,000 (46,500 for Lycées and 40,500 for Colleges). Last year it was only 84,700. These establishments may be considered as analogous to the English grammar-schools.

SCIENTIFIC SERIALS

Journal of the Franklin Institute, November.—The metric system: is it wise to introduce it into our machine-shops? by C. Sellers.—The weakening of steam boilers by cutting holes in the shell for domes and necks, by W. B. Le Van.—Observations in Brazil, by W. M. Roberts.

Rivista Scientifico-Industriale, October 31.—Résumé of solar observations at Palermo Observatory in the third quarter of 1880, by Prof. Ricco.—Experimental researches on the action of light on transpiration of plants, by Dr. Comes.—Dynamometric break with circulation of water, by Prof. Ricco.

Journal de Physique, November.—On the combination of phosphuretted hydrogen with hydrochloric acid, by M. Ogier.—An amplifying barometer, by M. Debrun.

SOCIETIES AND ACADEMIES LONDON

Linnean Society, November 18.—Robt. McLachlan, F.R.S., in the chair.—Dr. Geo. E. Dobson exhibited a remarkable parasitic worm from the intestine of *Megaderma frons*, from the Gold Coast. It appears allied to *Pterygodermatites plagiostoma*, Wedl, from the Long-eared Hedgehog, though on first hasty examination he (Dr. Dobson) had been disposed to regard it as a new genus, *Metabdelia*. Dr. McDonald further drew attention to its peculiar anatomical structure and relationships. Dr. Cobbold agreed to the importance of the observations as verifying previous discoveries, with addition of novel structural details. He considered the worm as identical with the *Ophiostomum* of Rudolphi and Willemoes Suhm, with *Pterygodermatitis* of Wedl, and with *Rictularia* of Froelich, and he regarded it as an aberrant member of the Ophiostomidae, whereas Wedl thought it came nearest the Cheiracanthidea.—Dr. Cobbold also exhibited specimens of *Distoma crassum*, Busk (previously in 1875 shown to the Society), from a Chinese missionary who, on return to China with his wife and daughter, were again all attacked by the parasite, and obliged to return to England.—A paper was read on a proliferous condition of *Verbascum nigrum*, by the Rev. G. Henslow. The upper part was very diffuse with leafy axes produced from the centres of the flowers, while the lower part had flowers with very large ovaries adherent within to arrested proliferous branches. These differences may be attributed to the general tendency of

the sap to run to the extremities and thus cause an excess of development above with simultaneous arrested condition below.—A paper on the classification of the Gasteropoda (part 2) was read by Dr. J. Dennis McDonald. In this communication the author gives further data in support of his mode of arranging the group dependent on anatomical characters.—“Novitates Capenses” was the title of a paper by Messrs. P. MacOwan and H. Bolus, in which, among other novelties described of South African plants, were *Ranunculus Baurii*, *Ericinella passerimoides*, *Orthosiphon ambiguus*, and *Herpolirion capensis*, the last a representative of a form hitherto known only from Australia.—A communication from the Rev. M. J. Berkeley, on Australian fungi (part 2), principally received from Baron F. von Müller, was taken as read.—Lieut. Col. H. Godwin-Austin was elected a Fellow of the Society.

Entomological Society, November 3.—Sir Jno. Lubbock, Bart., vice-president, in the chair.—Mr. E. Meyrick of Hungerford, Wilts, and Capt. Thos. Brown of Auckland, New Zealand, were elected as Ordinary Members, and Dr. J. E. Brandt, president of the Russian Entomological Society, was elected as a Foreign Member of the Society.—Mr. Waterhouse exhibited, on behalf of Mr. Sydney Olliffe, a pair of dwarfed specimens of *Epione cespertaria*, taken at Arundel.—Mr. McLachlan exhibited some curious galls on a broad-leaved *Eucalyptus* from Australia, which were stated to be made by a lepidopterous larva, and also mentioned that in a letter he had received from Mr. Rutherford, dated from Camarons, West Africa, the writer stated that he had taken *Papilio merops* and *Papilio cenea* in copula. Mr. Trimen doubted that the butterfly referred to by Mr. Rutherford was *P. cenea*, Stoll, which, to the best of his knowledge, was a form of the female confined to South Africa, and was more probably either *Hippocoon*, Fab., or one of the other prevalent West African forms.—Prof. Westwood exhibited a globular gall on the surface of a sawfly leaf made by a species of *Tenthredinidae*, and also a dipterous larva (*Syrphus*) found closely adhering to the stem of a pelargonium.—Mr. Kirby exhibited a remarkable variety of *Epunda lutulenta*, and also a remarkable form of *Apatura*, stated to have been taken by Mr. Ralfe in Pinner Wood.—Sir Jno. Lubbock exhibited some interesting larvæ which Mr. Culvert had forwarded to him from the Troad through Sir Joseph Hooker. He stated that these larvæ had recently appeared there in great numbers, and were likely to prove most useful, as they fed on the eggs of locusts. These larvæ were probably coleopterous, and Sir Jno. Lubbock suggested that if the species does not exist in Cyprus it might be worth while to introduce it there.—Mr. Trimen exhibited a wingless female specimen of the Hymenoptera, which he had strong grounds for believing was the female of the well-known *Dorylus helvolus*, Linn.—Mr. Trimen also exhibited six cases fabricated by a South African lepidopterous larva, of which the outer covering consisted of particles of sand and fragments of stone, which gave them a most peculiar aspect, resembling in general appearance a myriapod.—Sir Sydney Saunders read a paper on the habits and affinities of the hymenopterous genus *Scleroderma*, with descriptions of new species.—Mr. Edward Saunders read a paper entitled a synopsis of British *Heterogyna* and fossorial *Hymenoptera*.—Prof. Westwood read a paper containing descriptions of new species of exotic diptera, with a supplement containing descriptions of species formerly described by the author in somewhat inaccessible publications.

PARIS

Academy of Sciences, November 15.—M. Edm. Becquerel in the chair.—Researches in isomerism, benzene, and dipropargyl, by MM. Berthelot and Ogier.—On papaine; new contribution to the study of soluble ferments, by M. Wurtz. In one experiment 0.05 gr. of papaine fluidified about two thousand times its weight of moist fibrine. It seems that it begins by fixing on the fibrine, and the insoluble product gives, by action of water, soluble products of hydration of fibrine, while the ferment, becoming free again, may act on a new portion of fibrine. The action is thus related to that of chemical agents, e.g. sulphuric acid.—Enrichment of plumbic earths by a current of compressed air, by M. Delesse. The apparatus, called *trieur à soufflet*, effects a sorting of pulverulent matters, which cannot be separated by water. Earths of very fine grain cannot well be treated with it, and unfortunately it is they that contain most lead. The lead-dust produced is unhealthy for the workmen.—Observations of M. de Quatrefages on the Marquis de Nadaillac's work, “Les premiers Hommes et les Temps préhistoriques.” M. de Quatrefages thinks that man probably existed in Portugal in the Tertiary epoch.—Observations on the publication of Dr. Guérin's works, by M. de Quatrefages.—On the arrangement of the cervical vertebrae in the Chelonians, by M. Vaillant.—Experimental researches on the heat of man during movement, by M. Bonnal. *Inter alia*, all muscular exercise raises the rectal temperature. The increase is not directly related either to duration of the exercise or to apparent fatigue. The altitude, state of the atmosphere, energy of movements, and nature of clothing affect the increase. All rapid exercise diminishes the peripheral temperature (in mouth, armpit, or groin). The rectal heat may reach 39.5°. In rapid climbing it is in the first half hour that the rectal temperature is most raised, it may then become stationary or fall. In general, a rigorous application of the laws of mechanics to the human system is not warranted.—Studies on the habits of phylloxera during August to November 1880, by M. Fabre. The young insects showed (in the author's experiments) a strong liking for light. The present year seems very unfavourable to the parasite.—On some linear differential equations, by M. Brioschi.—On the equilibrium of flexible and inextensible surfaces, by M. Lecornu.—On the compressibility of oxygen and the action of this gas on mercury when put in contact with it, by M. Amagat. Oxygen and mercury (pure and dry) he found to remain indefinitely long in contact without absorption. He operated at 50° and 100°, and with pressures from 110 to 420 atm. The compressibility of oxygen follows the laws he gave in his memoir of August 30. MM. Chevreul and Dumas made remarks on the subject.—On the liquefaction of ozone in presence of carbonic acid, and on its colour in the liquid state, by MM. Hautefeuille and Chappuis. Gradual compression of a mixture of ozonised oxygen and carbonic acid at -23° gives a blue liquid of the same shade as the gas above. The products of decomposition of carbonic acid by the effluve are proved (by the blue colour on compressing) to contain a large proportion of ozone.—On malleable iron, by M. Forquignon. It seems to be intermediate between steel and grey pig-iron, differing from the latter by the special nature of its amorphous graphite and its greater tenacity; from steel, by its small elongations and its large proportion of graphite.—On the presence of phosphorus in the rocks of Brittany, by M. Lechartier.—On the composition of petroleum of the Caucasus, by MM. Schützenberger and Ionine.—On the temperatures of inflammation of gaseous mixtures, by MM. Mallard and Le Chatelier. Among other results, mixtures of protocarburetted hydrogen not only enter into slow combustion, but, when submitted to a certain temperature, may be inflamed after a variable time (which is longer the lower the temperature).—On the secondary wave of muscle, by M. Richet. A second contraction occurs, without fresh stimulation.—On the contagion of boils, by M. Trastour.—On the use of boring machines without use of explosive matter, by M. Biver. The advantages of Mr. Brunton's system are indicated.

CONTENTS

	PAGE
POLITICAL ECONOMY	97
OUR BOOK SHELF:—	
Sharp's "Avis préliminaire d'une nouvelle Classification de la Famille des Dytiscidae"	98
"Aid to the Identification of Insects"	98
LETTERS TO THE EDITOR:—	
Geological Climates.—Prof. SAM'L. HAUGHTON, F.R.S.	98
"Sulphuric Acid and Alkali."—Prof. H. E. ROSCOE, F.R.S.	99
A General Theorem in Kinematics.—Prof. J. D. EVERETT, F.R.S.	99
Phosphorescent Centipedes.—B. E. BRODHURST	99
The Yang-tse, the Yellow River, and the Pei-ho.—Surgeon H. B. GUPPY	99
Aurora observed at Ovoca, Co. Wicklow, November 3.—Observations from 5.30 p.m. to Midnight.—G. H. KINAHAN	100
MR. SPENCER AND PROF. TAIT. By HERBERT SPENCER	100
NOTES ON THE GEOLOGY OF EAST-CENTRAL AFRICA. By JOSEPH THOMSON (With Diagrams)	102
INCANDESCENT ELECTRIC LIGHTS	104
SUBTERRANEAN FOREST IN INDIA (With Diagrams)	105
NOTES	106
ABNORMAL VARIATIONS OF BAROMETRIC PRESSURE IN THE TROPICS, AND THEIR RELATION TO SUN-SPOTS, RAINFALL, AND FAMINES. By FRED. CHAMBERS	107
THE ROYAL SOCIETY.—ADDRESS OF THE PRESIDENT. By WILLIAM SPOTTISWOODE, D.C.L., LL.D.	111
OUR ASTRONOMICAL COLUMN:—	
Lunar Eclipses, 1880-84	114
A Probable Variable Star	115
Faye's Comet	115
Swift's Comet	115
UNIVERSITY AND EDUCATIONAL INTELLIGENCE	115
SCIENTIFIC SERIALS	115
SOCIETIES AND ACADEMIES	115